

No. 646,371.

Patented Mar. 27, 1900.

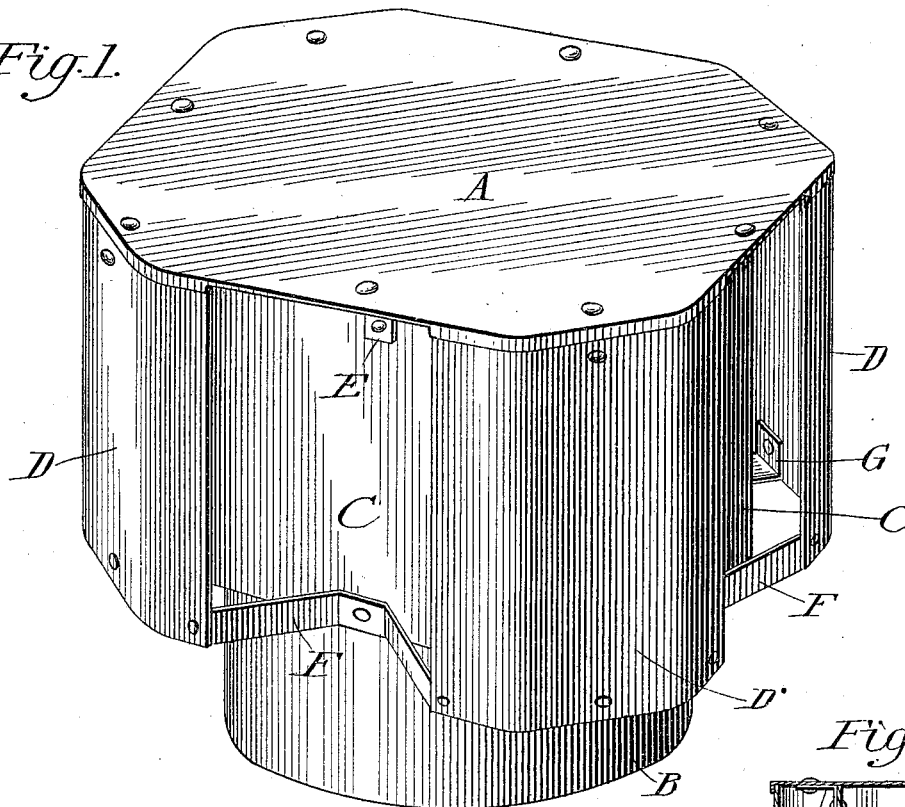
R. M. PANCOAST.  
ROOF VENTILATOR OR CHIMNEY COWL.

(No Model.)

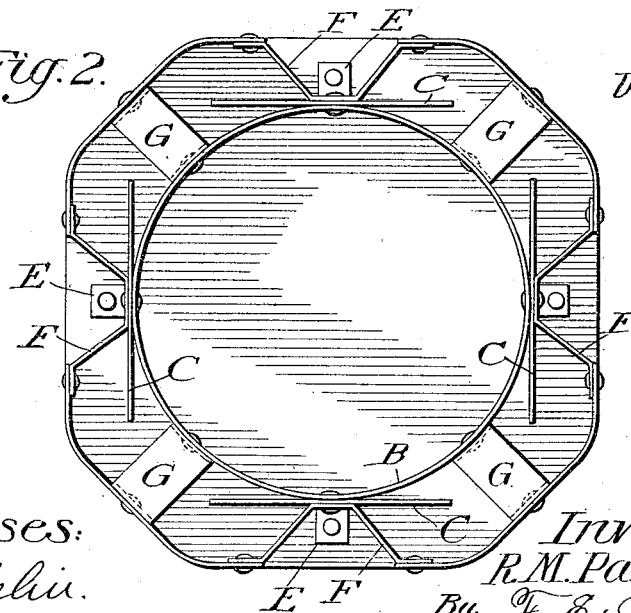
(Application filed Sept. 16, 1899.)

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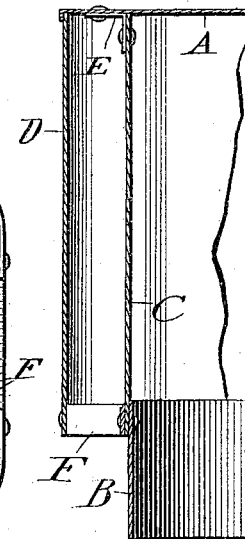
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



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## ROOF VENTILATOR OR CHIMNEY COWL.

(Application filed Sept. 16, 1899.)

3 Sheets—Sheet 2.

(No Model.)

Fig. 4.

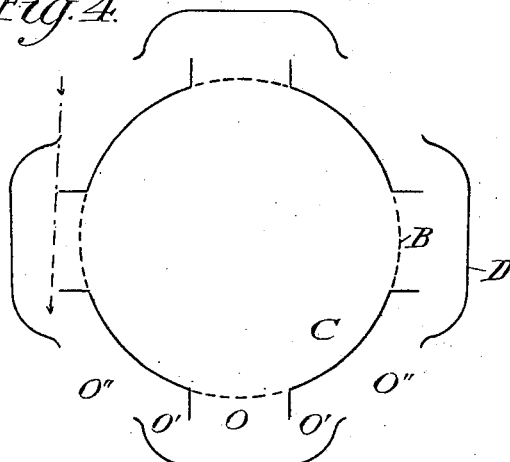


Fig. 5.

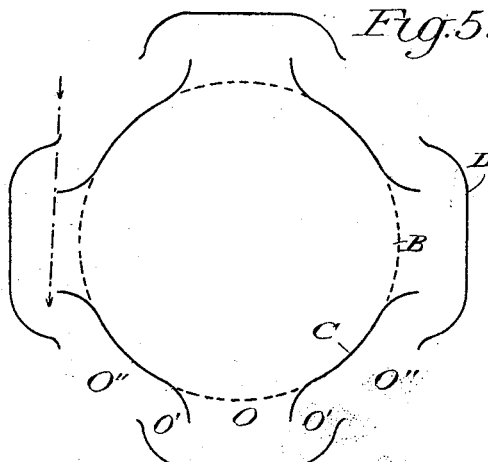


Fig. 6.

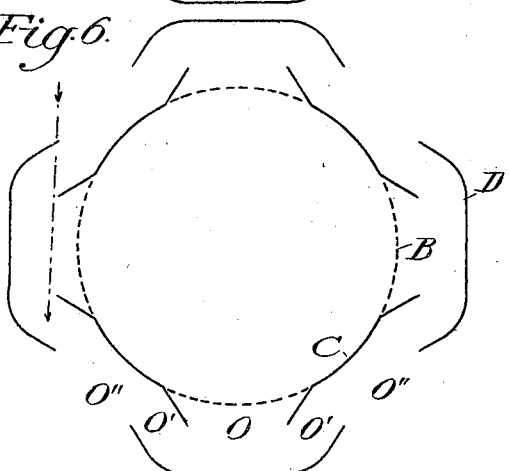


Fig. 7.

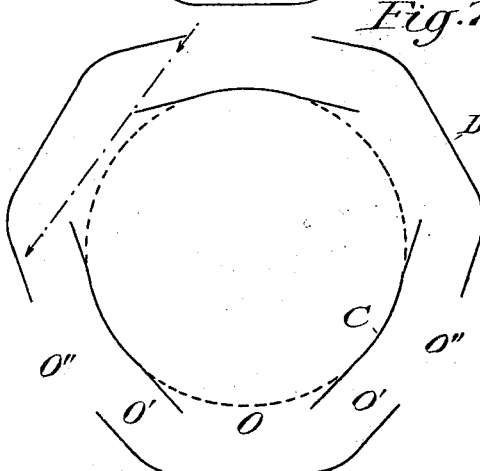


Fig. 8.

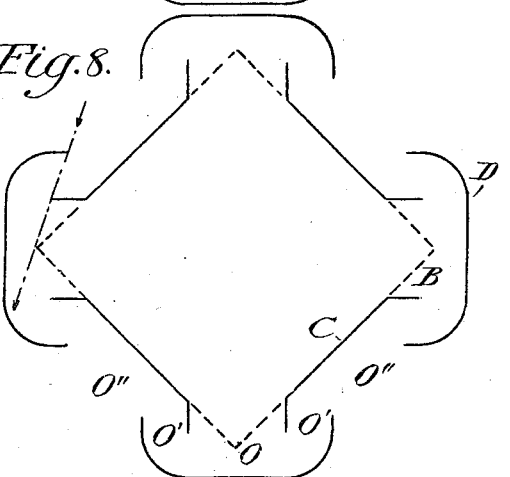
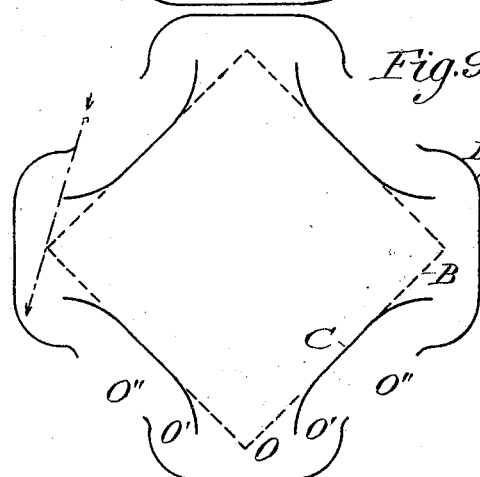


Fig. 9.



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R. M. PANCOAST.  
ROOF VENTILATOR OR CHIMNEY COWL.

(Application filed Sept. 18, 1899.)

(No Model.)

3 Sheets—Sheet 3.

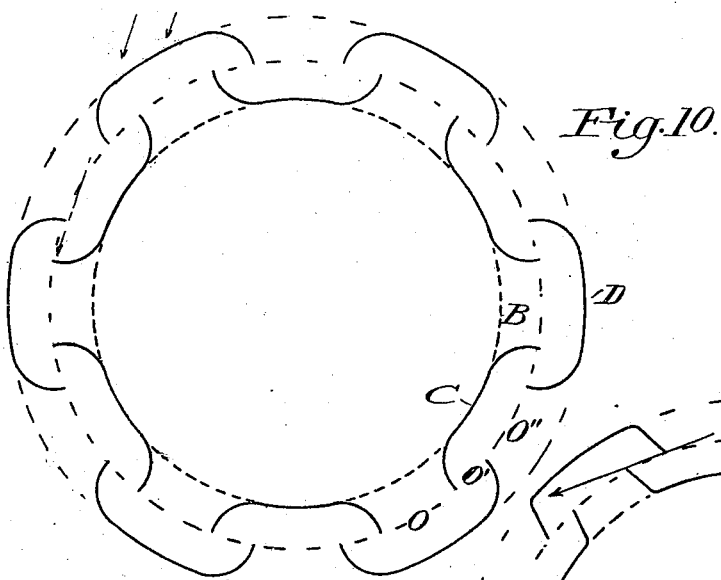


Fig. 11.

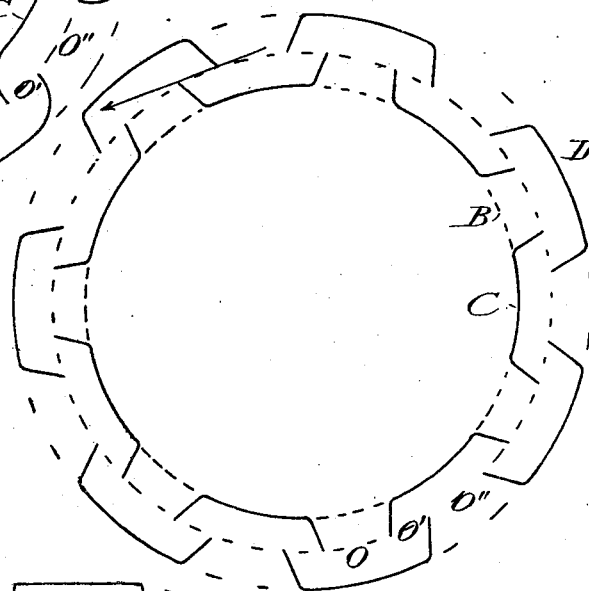
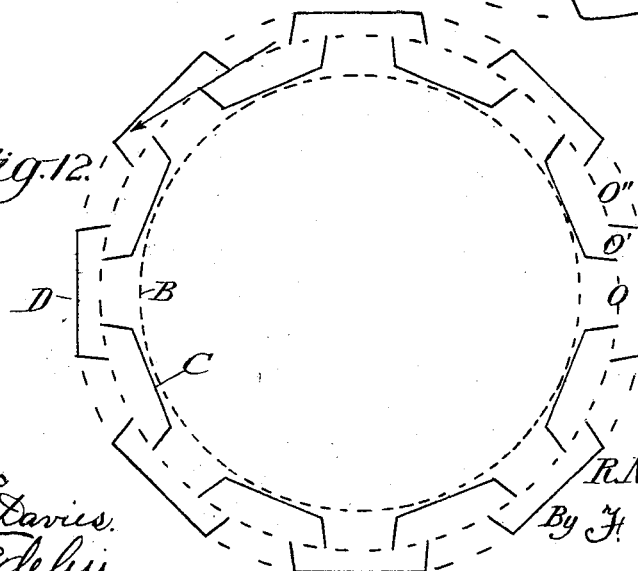


Fig. 12.



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# UNITED STATES PATENT OFFICE.

RICHARD M. PANCOAST, OF CAMDEN, NEW JERSEY.

## ROOF-VENTILATOR OR CHIMNEY-COWL.

SPECIFICATION forming part of Letters Patent No. 646,371, dated March 27, 1900.

Application filed September 16, 1899. Serial No. 730,780. (No model.)

*To all whom it may concern:*

Be it known that I, RICHARD M. PANCOAST, a citizen of the United States, residing at Camden, in the county of Camden and State of New Jersey, have invented certain new and useful Improvements in Roof-Ventilators, of which the following is a specification.

The object of my invention is the production of a roof-ventilator and chimney-cowl which will have a free lateral delivery of the least possible divergence as distinguished from a delivery which is downward and lateral, the same being characteristic of many ventilators and cowls now in use having a dead-air space at the top; which will not obstruct the outward passage of the inside air and "choke" when the outside air is calm; which shall be provided with an anti-ingress covering that will effectively exclude rain, snow, cinders, and currents of air from all directions, and thus obviate any possible downdraft; which will deflect downwardly and outside the collar of the ventilator all foreign substances that may by chance enter between the outside plates; which shall consist of a few simple parts of such shapes as will economize the quantity of metal used in its formation, and which shall be cheap in first cost, strong, rigid, simple in construction, and, withal, shall constitute a superior device for performing the functions demanded of an efficient roof-ventilator or chimney-cowl.

With the above ends or purposes in view my invention consists in certain novelties of construction and combinations and arrangements of parts hereinafter described, and set forth in the claims.

The accompanying drawings illustrate ten examples of the physical embodiment of my invention constructed according to the best modes or methods I have so far devised for the application of the principle.

Figure 1 is a perspective view of a desirable form of the ventilator. Fig. 2 is a bottom plan view showing the relative locations and dispositions of the several elements one to another. Fig. 3 is a perpendicular section through one side of Fig. 1, showing an inside plate with its edge extended below the top of the collar. Figs. 4 to 12 are horizontal sectional views of slightly-modified forms of the ventilator. Figs. 4, 5, and 6 show forms analo-

gous to that illustrated in Fig. 1. Fig. 7 shows a form having three inside and three outside plates. Figs. 8 and 9 are forms having square collars or neck-openings. Fig. 10 shows a form having six inside and six outside plates. Fig. 11 has seven inside and seven outside plates. Fig. 12 shows eight inside and eight outside plates.

Referring to the several figures, the letter A designates a top plate or cover consisting of a single sheet of thin metal of an approximately-circular form.

B is the collar or neck of the ventilator, shown as circular or square in outline, but which may be of any shape.

C are the inside plates, located with their side edges perpendicular to the plane of the top plate and with their lower edges tangent or adjacent to the outside of the collar and extending some distance below its top edge.

D are the outside concavo-convex plates, each being curved or bent laterally and attached at the top edge to the outer edge of the top plate and depending therefrom.

E are clips which secure the inside plates to the top plate some distance outwardly from the inner circumference or the boundary-line of the extension of the neck-opening. These clips are riveted to the top plate and to the inside plates on the outside, so that the rivet-holes will lie in perpendicular lines, which fall outside of the collar, the object being to prevent any water from dripping inside the collar should the rivet-holes become enlarged by rusting or otherwise. Any number of clips desirable may be used and also located at the corners of the inside plates when the structure is of a large size and to be rendered very rigid.

F are metallic clips or braces each riveted to the lower edge of the outside plates, to an inside plate, and to the collar, a single rivet in some cases being passed through a brace, an inside plate, and the body of the collar.

G are braces uniting the outside plates and collar. These braces F and G may be applied in any desired positions and any suitable number employed, or other means may be selected for uniting the plates and collar.

In Fig. 1 the inside plates are shown nearly flat, in Fig. 7 they are slightly curved at the center, and in the remaining examples the

perpendicular free edges are bent or flared outwardly from the circumferential outline of the collar. In all the examples the free edges of the inside plates lie in lines perpendicular to the top plate or cover and fall outside of the collar. The lower edges of the said inside plates also extend below the collar, as shown in Fig. 3, and on the outside thereof, as previously described. On reference to each example and the arrows thereupon it will be seen that the relative location of the outside plates D to the inside plates C is such that a straight line drawn horizontally from the free edge of an outside plate to the adjacent free edge of an inside plate and prolonged will pass outside of the collar or neck-opening and also beyond the free edge of an adjacent inside plate.

From the foregoing specific description it will become clear that I have produced a ventilator or cowl which fulfils all the conditions set forth as the purpose or object of my invention.

The theory according to which I have constructed my ventilator and which I find to be correct in practice is that the functions of any covering or cowl for a flue or chimney should be the exclusion of rain or snow or other foreign matter and the downward currents of air that are present more or less in various locations and under certain conditions. The covering must also be of such construction that the free exit of the inside air, smoke, and gases will not be impeded when the outside air is calm. In other words, there must be secured at all times a practically-uniform discharge volume. Now my construction practically solves the problem and is adapted to effectively perform all the requisite functions. There is no dead-air space at the top of my ventilator, which would necessitate the downward passage of the discharging air before it finds a lateral outlet. The relative areas of the neck-opening, the areas of the openings between the inside plates, the areas of the openings between the outside plates, and the areas of the lateral passages or the distances between the inside and outside plates are such that there is a free uniform delivery of air outwardly at all times during a calm. For example, in each form the area of the neck-opening equals the area of the openings O between the edges of the inside plates, the area of the lateral passages O', and the areas of the openings O'' between the edges of the outside plates. In all cases the sum of the widths of the openings O' or O' or O'' multiplied by the height should practically equal the area of the neck-opening. These relative proportions of area will insure a free delivery, which will be further facilitated by, within limit, enlarging the openings O, O', and O'' either in width or height.

The relative location of the collar and the inside and the outside plates, as shown, will also exclude downward currents of air and deflect outside the collar or neck all foreign

substances which may be contained therein and move therewith. In each example illustrated the free edges of the outside plates D are bent or curved so as to slightly overlap the adjacent edges of the inside plates, which latter lie outside the circumference of the neck-opening or collar. These outside plates are, moreover, located as nearly as possible to the collar and the inside plates as is consistent with preserving the relative areas of the discharge-openings hereinbefore described.

It is found that the prevailing movements of external currents of air are lateral and downward or lateral and upward, or, in other words, are oblique. An outside upper current is very rare and a vertical current exceptional. The upward oblique currents can enter only a portion of one side of the ventilator and its opening beneath the lower ends of the plates. The suction on the opposite side of the same, however, will be such that the uplift or exhaust will be preserved, and hence there will be occasioned no choking or back draft whatever within the neck-opening. The downward oblique currents of air obviously assist the draft. A straight side wind against any part of the ventilator comes in contact with the outer surfaces of the plates D and a small portion enters between the windward plates; but the area of the plates is greater than the area of the openings, and consequently the deflection induces an outward suction more than sufficient to overcome any tendency of the air to pass inwardly. Whatever currents may find their way in between the outer plates are deflected outwardly by the flaring edges of the inner plates, and this induces an exhaust within the collar. It is obvious that foreign matter of greater specific gravity than the air when carried by it will, when the same strikes the surface of the inside plates, be deflected and invariably fall outside the neck-opening.

The ends of cheapness and simplicity of construction are also attained. The inner and outer plates and collar are all made from rectangular pieces of metal, which are easy to cut and not wasteful of material, as when circular pieces are used. The curve given to the outer plates is conducive to strength, and hence they may be of lighter metal than usual, and inasmuch as they protect the inner plates the latter may be of still lighter and cheaper material. The forms illustrated in Figs. 1 and 7 are, perhaps, the best of the several examples shown. They consist of the fewest number of parts and have the widest and least number of openings, and consequently require in their formation the least amount of labor and material.

The specimens provided with multiopenings will for the same volume of discharge necessarily consist of a greater number of parts, be of greater heights, and require more labor and metal for their construction than the preferred forms mentioned.

Finally, while I have illustrated and de-

scribed only ten examples of the physical embodiment of my invention, I do not thereby intend to exclude other shapes or forms which involve mere modifications, inasmuch as innumerable colorable alternations may be introduced at the choice of the manufacturer without constituting a substantial departure.

What I claim is—

1. A roof-ventilator comprising a top plate; a collar; a series of separate inside plates secured to the top plate at right angles thereto, and to the collar; and a series of concavo-convex outside plates secured at their top edges to the top plate; open spaces being left between the lower edges of the outside plates and the collar; in substance as set forth.

2. A roof-ventilator comprising a top plate; a collar; a series of separate inside plates secured at their bottom edges to the collar and extended some distance downward from the top edge of the said collar; a series of concavo-convex outside plates secured at their upper edges to the top plate; and braces for the lower edges of the outside plates; open spaces being left between the lower edges of the outside plates and the collar; in substance as set forth.

3. A roof-ventilator comprising a top plate; a collar; a series of separate inside plates attached at their lower edges to the outer surface of the collar; and a series of concavo-convex outside plates; the free perpendicular edges of the inside plates being extended or flared outside the line bounding the collar or neck-opening; and open spaces being left between the lower edges of the outside plates and the collar; in substance as set forth.

4. A roof-ventilator comprising a top plate; a collar; a series of separate inside plates secured to the outside of the collar; and a series of outside plates; the said outside plates having their perpendicular free edges bent to lap over the free edges of the inside plates so that a straight line drawn from the edge of an outer plate to the adjacent edge of an inside plate and prolonged will pass outside the neck-opening; and open spaces being left between the lower edges of the outside plates and the collar; in substance as set forth.

5. A roof-ventilator, constructed substan-

tially as described, and having the perpendicular edges of the outside plates bent so as to overlap the free edges of the separate inner plates; said free edges being flared or extended beyond the line bounding the collar or neck-opening; and open spaces being left between the lower edges of the outside plates and the collar; in substance as set forth.

6. A roof-ventilator comprising a top plate; a collar; a series of separate inside plates; and a series of concavo-convex outside plates the said inside plates and the said outside plates being located outside the line bounding the collar or neck-opening with their lower horizontal edges extended below the top of the collar and the spaces between the lower ends of the said inside and outside plates being practically open and unobstructed; in substance as set forth.

7. A roof-ventilator comprising a top plate; a collar; a series of separate inside plates; and a series of concavo-convex outside plates attached at their upper edges to the top plate, the lower edges being free, thus leaving an open space adjacent the collar; the arrangement of the parts being such that the combined areas of the openings O, the combined areas of the passages O', and the combined areas of the openings O'', will each be equal to or greater than the area of the collar or neck-opening; whereby a free and unobstructed delivery will be secured; in substance as set forth.

8. A roof-ventilator comprising a top plate; a collar; a series of separate inside plates; and a series of concavo-convex outside plates; the said inside plates being secured to the top plate inwardly from its circumference or outer boundary-line; and the outer plates being secured at their top edges to the top plate adjacent its circumference or outer boundary-line; and open spaces being left between the lower edges of the outside plates and the collar; in substance as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

RICHARD M. PANCOAST.

Witnesses:

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DAVID SCULL.